

## **REMARKS**

### **Status of the Claims and Formal Matters**

Claims 1-2, 6, 8-9, 12-17, 23-29, and 63-74 are currently pending in the application.

### **Rejection under 35 U.S.C. § 103(a)**

There is a single rejection remaining in this case -- under 35 U.S.C. § 103(a) as being allegedly unpatentable over Chee et al., U.S. 2003/018088867 (“Chee”) in view of Krull et al., WO 98/58079 (“Krull”). Applicants also submit herewith the Declaration of Dr. Marcel Margulies (“Margulies Declaration ¶ \_\_”). The rejection should be withdrawn in view of the arguments and data presented in Dr. Margulies’ declaration and made herein.

Applicants acknowledge with appreciation the December 12, 2006 Interview with the Examiner. At the Interview, Applicants discussed the § 103 rejection in view of the express limitations recited in the claims, which are directed to a novel method for sequencing a nucleic acid comprising a cavitated fiber optic wafer formed from a fused bundle of a plurality of individual optical fibers, each individual fiber having specified dimensions (or to an apparatus having such a substrate). Specifically, each of the claims require that each individual optical fiber has a diameter between 3 and 100  $\mu$ M, the thickness of the wafer ( i.e., length of the optic fiber) between the top surface and the bottom surface is between 0.5 mm and 5.0 mm and the depth of each well ranges from between one half the diameter of an individual optical fiber and three times the diameter of an individual optical fiber. These specific parameters of the claimed cavitated fiber optic wafers are not chosen arbitrarily. Margulies Declaration ¶ 5.

As Dr. Margulies demonstrates in his declaration, the claimed wafer thickness is important for light transmission properties of the claimed wafer. In fact, the light transmission in the claimed thickness range is nearly 100%, in contrast with only about 18% for a 300 mm fiber. Margulies Declaration ¶ 7.

In addition, the claimed well diameter and well depth parameters are important to the diffusion properties of the substrate recited in each of the claims. Paragraphs 8 - 13 of Dr.

Margulies' declaration demonstrate that there are a number of competing requirements that must be balanced in selecting the well diameter and well depth dimensions in a nucleic acid sequencing application.

Finally, Dr. Margulies notes that Chee alone is insufficient to lead to the claimed invention. Chee is silent as to the specific express dimensions claimed here. Further, the combination of Chee and Krull cannot be maintained. Krull is not properly combined with Chee - in fact Krull teaches away, since Krull encourages light transmission across the circumferential surface of a fiber by removing the cladding on any one fiber. If combined with Chee, this would lead to a fused fiber optic with no cladding between the fused fibers -- leading to complete cross-talk between each of the fused fibers -- a fatal deficiency when trying to resolve individual light signals in each separate fiber. Margulies Declaration ¶¶ 14-16.

For the foregoing reasons, the rejection should be withdrawn.

### **CONCLUSION**

Applicants believe that the claims as amended are patentable and a prompt allowance is respectfully requested.

If further discussion of this case is deemed to be helpful, the Examiner is encouraged to contact the undersigned at the telephone number provided below, and is assured of full cooperation in progressing the instant claims to allowance.

Respectfully submitted,

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*Ilona Gont*  
Ivor Elrifi, Reg. No. 39,529  
Ilona Gont, Reg. No. 58,714  
MINTZ, LEVIN, COHN, FERRIS, *et al.*  
666 Third Avenue, 24<sup>th</sup> Floor  
New York, NY 10017  
Telephone: (212) 935-3000  
Telefax: (212) 983-3115